

REMARKS

Support for the amendment to claim 24 can be found on page 10, third full paragraph. Hence, no issue of new matter arises, and entry thereof is requested respectfully.

In Item No. 4 on page 3 of the Office Action, Claims 12 and 24 were rejected under 35 U.S.C. §102(e) over U.S. Patent No. 5,919,523.

According to the Examiner, the various elements of making a polyfunctional copolymer monolayer on a substrate are taught in the '523 patent, for example, as set forth in the sixth full paragraph in the Summary in column 2 of the patent. The Examiner also stated that the third full paragraph and the paragraph bridging columns 11 and 12 teach the initiators set forth in claim 12.

The rejection is traversed for the following reasons.

The present invention relates to a method where polymerization, typically a radical polymerization of C-C double bonds, is started from an initiator immobilized on a surface. On the other hand, the molecular species immobilized on the surfaces of the '523 patent are linkers and not polymerization initiators as claimed.

For example, the '523 patent teaches adding preformed polymers to the surface, see, e.g. Figures 8 to 11 of U.S. Patent 5,919,523 where a polymer is added and bound to a functional surface. While Figure 12 of the '523 patent mentions an in situ

polymerization, it is clear from that figure that the polymerization is started by a free initiator, ammonium persulfate, and the remaining polymer, as discussed previously, is merely linked to the surface by a moiety immobilized thereon.

Thus, there is no disclosure in the '523 patent of the essential feature of the present invention that a radical or ionic polymerization initiator is immobilized on the surface from which a polymer is grown in a subsequent step, which results in a highly ordered monolayer of a copolymer.

Hence, anticipation does not exist and the rejection can be removed.

In Item No. 6 on page 4 of the Office Action, Claims 12-14 and 24 were rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 6,485,703 in view of U.S. Patent No. 6,132,765.

According to the Examiner, both patents relate to subject matter of derivatizing a solid surface to provide a number of reactive sites thereon. The Examiner indicated that motivation to combine the teachings of the two references would be to attach the functional groups of the '765 patent to the monolayer produced by the '703 patent to provide the added benefit of having a derivatized monolayer on the surface of a medical device thereby reducing device-related infections as taught in the '765 patent. The Examiner further alleged that the subject matter of dependent 12-14 are taught in the '703 patent.

The rejection is traversed for the following reasons.

The '765 patent relates essentially to catheters that have bonded thereto therapeutic agents which render the catheters therapeutic per se. One of the purposes is to prevent, for example, biofilm production by the presence of microbes in the catheter.

Neither of the documents discloses the immobilization of a polymerization initiator on a surface. Thus, the cited patents taken alone or in combination cannot render the present invention obvious. A *prima facie* case of obviousness has not been made and the rejection cannot stand.

More specifically, regarding the immobilization of a substance on a surface, the Examiner referred to column 5, lines 56 to 62 and to column 26, line 10 of the '703 patent. However, the respective passages only refer to a hydrogel which is coated on a surface. The '703 patent is completely silent on the immobilization of an initiator and a polymerization reaction started by that initiator.

This is even more apparent from a closer consideration of the disclosure in column 25, line 65 to column 26, line 18, to which the Examiner referred. Thus, when producing a hydrogel film on an electrode according to the '703 patent, a mixture of monomers and a polymerization initiator are coated onto an electrode and subsequently polymerized. Thus, in the process of the '703 patent, there is no immobilization and linkage of initiators on the surface. The hydrogel obtained is only attached to the surface via weak physical attraction such as van der Waals forces, but is not linked to the surface.

Moreover, due to the fact that a simple mixture of monomers and initiators is

applied to a surface, polymerization will not necessarily yield a copolymer monolayer as in the present invention. Monolayers are mentioned in the context of the '703 patent in column 25, lines 58 to 64, a passage which is also referred to by the Examiner. However, those monolayers which form a separate embodiment of the '703 patent are formed in a conventional process by contacting alkane thiols with the surface. Again, there is no in situ formation of polymer monolayers on the surface via polymerization.

Summing up, the '703 patent discloses in one embodiment, the formation of a polymer on a surface, which, however, does not include immobilization of polymerization initiators on the surface and which does not yield a polymer monolayer but a polymer film coated on the surface. In a separate embodiment, the '703 patent discloses the formation of monolayers, which however, does not rely on a polymerization process carried out on and at the surface, let alone in the presence of initiators immobilized thereon in a first step. There is neither teaching nor suggestion in the '703 patent of forming a reactive monolayer on a surface where polymerization occurs.

Similarly, the '765 patent does not disclose the immobilization of initiators on a surface from which a copolymer monolayer is grown. Rather, the '765 patent discloses the immobilization of preformed polymers, such as a hydrogel or a protein, to a surface with a bifunctional linker molecule, see column 5, line 65 to column 6, line 6. For that purpose, the linker is reacted with the polymer and subsequently with the substrate. That is in marked contrast with the process of the present invention where a polymer is formed starting from an initiator which is immobilized on the surface in a first step.

Thus a *prima facie* case of obviousness has not been made and the rejection

Applicant: KLAPPROTH et al.
Application No. 09/889,935
Attorney Docket No. 105032-991220

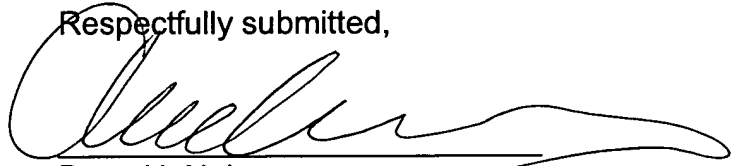
must be withdrawn.

CONCLUSION

Applicants submit that the pending claims are in condition for allowance. Reexamination, reconsideration, withdrawal of the rejections, and early indication of allowance are requested respectfully. If any questions remain, the Examiner is urged to contact the undersigned at the local exchange noted below. If any fees are found to be applicable, please charge any additional fees or make any credits to Deposit Account No. 07-1896.

Date: 21 October 2004

Respectfully submitted,



Dean H. Nakamura
Registration No. 33,981
GRAY CARY WARE & FREIDENRICH LLP
1625 Massachusetts Avenue, N.W.
Suite 300
Washington, D.C. 20036-2247
Telephone: (202) 238-7731
Facsimile: (202) 238-7701